

**Amendments to the Claims:**

This listing of the claims will replace all prior versions and listings of the claims in this application:

1-2. (Canceled)

3. (Previously Presented) An apparatus for measuring current flow through a living body, comprising:

data acquisition circuitry consisting essentially of a first contact and a second contact configured for placement on a living body to measure voltage between said first contact and said second contact thereby producing voltage data, and a first connector connected at a first end to said first contact and a second connector connected at a first end to said second contact; and

a portable data processing unit connected to a second end of said first connector and to a second end of said second connector to process said voltage data and body impedance data to produce current flow data representing an amount of current flow through the living body, wherein said portable data processing unit includes acquired data conditioning circuitry to condition a data signal from said first contact and said second contact.

4. (Previously presented) The apparatus of claim 3 wherein said portable data processing unit includes data input interface circuitry.

5. (Original) The apparatus of claim 4 further comprising a keypad connected with said data input interface circuitry.

6. (Previously presented) The apparatus of claim 3 further comprising an autonomous power source.

7. (Previously presented) The apparatus of claim 3 wherein said portable data processing unit includes data output interface circuitry.

8. (Original) The apparatus of claim 7 further comprising a visual display connected to said data output interface circuitry.

9. (Original) The apparatus of claim 7 further comprising a compact removable flash memory card connected to said data output interface circuitry.

10. (Canceled)

11. (Previously Presented) An apparatus for measuring current flow through a living body, comprising:

data acquisition circuitry consisting essentially of a first contact and a second contact configured for placement on a living body to measure voltage between said first contact and said second contact thereby producing voltage data, and a first connector connected at a first end to said first contact and a second connector connected at a first end to said second contact; and

a portable data processing unit connected to a second end of said first connector and to a second end of said second connector to process said voltage data and body impedance data to produce current flow data representing an amount of current flow through the living body, wherein said portable data processing unit includes a central processing unit and a memory storing a set of executable programs and said body impedance data comprised of known body impedances.

12. (Previously presented) The apparatus of claim 11 wherein said known body impedances include estimated impedances.

13. (Previously presented) The apparatus of claim 11 wherein said known body impedances include calculated impedance measurements.

14. (Previously Presented) An apparatus for measuring current flow through a living body, comprising:

data acquisition circuitry consisting essentially of a first contact and a second contact configured for placement on a living body to measure voltage between said first contact and said second contact thereby producing voltage data, and a first connector connected at a first end to said first contact and a second connector connected at a first end to said second contact, thereby producing voltage data; and

a portable data processing unit connected to a second end of said first connector and to a second end of said second connector to process said voltage data and body impedance

data to produce current flow data representing an amount of current flow through the living body, wherein said portable data processing unit includes a central processing unit and a memory storing a set of executable programs and a parameter calculator that compares conditioned data with known body impedances to generate data on said current flow through said living body.

15. (Previously presented) The apparatus of claim 11 wherein said memory stores an output module that controls data storage to a removable flash memory.

16. (Previously presented) The apparatus of claim 11 wherein said memory stores an output module that controls the menu of an LCD display.

17. (Previously Presented) An apparatus for measuring current flow through a living body, comprising:

data acquisition circuitry comprising a first contact and a second contact configured to generate voltage data from a living body; and

a data processing unit electrically connected to said data acquisition circuitry, wherein said data processing unit comprises a memory configured to store generic body impedance data and an executable program to calculate a current flow through said living body using said voltage data and said generic body impedance data.

18. (Previously presented) The apparatus of claim 17, wherein said data processing unit further comprises:

at least two channels electrically connected to said first and second contacts, respectively, wherein each of said channels comprises a low noise filter, a high pass filter, a low pass filter, an adjustable threshold detector and an analog to digital converter;

a system bus electrically connected to said channels;

a central processing unit electrically connected to said system bus; and

wherein said memory is electrically connected to said system bus and comprises a set of executable programs.

19. (Previously presented) The apparatus of claim 18, further comprising:

an LCD display electrically connected to said data processing unit;

a removable memory capable of being electrically connected to said data processing unit; and

an autonomous power supply electrically connected to said data processing unit.

20. (Previously presented) The apparatus of claim 17 wherein said data processing unit includes acquired data conditioning circuitry to condition a data signal from said first contact and said second contact.

21. (Previously presented) The apparatus of claim 20 wherein said acquired data conditioning circuitry includes an amplifier.

22. (Previously presented) The apparatus of claim 17 wherein said data processing unit includes data input interface circuitry.

23. (Previously presented) The apparatus of claim 22 further comprising a keypad connected with said data input interface circuitry.

24. (Previously presented) The apparatus of claim 17 further comprising an autonomous power source.

25. (Previously presented) The apparatus of claim 17 wherein said data processing unit includes data output interface circuitry.

26. (Previously presented) The apparatus of claim 25 further comprising a visual display connected to said data output interface circuitry.

27. (Previously presented) The apparatus of claim 25 further comprising a compact removable flash memory card connected to said data output interface circuitry.

28. (Previously presented) The apparatus of claim 17 wherein said memory is configured to store generic body impedance data comprising known body impedances.

29. (Previously presented) The apparatus of claim 28 wherein said known body impedances include estimated impedances.

30. (Previously presented) The apparatus of claim 28 wherein said known body impedances include calculated impedance measurements.

31. (Previously presented) The apparatus of claim 17 wherein said memory stores an output module that controls data storage to a removable flash memory card.

32. (Previously presented) The apparatus of claim 17 wherein said memory stores an output module that controls the menu of an LCD display.

33. (Previously presented) The apparatus of claim 14 wherein said memory stores an output module that controls data storage to a removable flash memory.

34. (Previously presented) The apparatus of claim 14 wherein said memory stores an output module that controls the menu of an LCD display.

35. (Previously Presented) The apparatus of claim 3, wherein said acquired data conditioning circuitry includes an amplifier.

36-39. (Canceled)

40. (Previously Presented) A system for measuring current flow through a living body, comprising:

data acquisition circuitry comprising a first contact and a second contact configured to measure a voltage in a living body associated with the living body's environment without applying a current to the living body, thereby providing voltage data;

a data processing unit electrically connected to said data acquisition circuitry, wherein said data processing unit is configured to store said voltage data on a removable memory; and

a central processing unit configured to receive said voltage data from said removable memory and to calculate current flow through the living body between said first contact and said second contact from said voltage data and known body impedance data.

41. (Previously Presented) The system of claim 40 wherein said data processing unit includes data input interface circuitry, data output interface circuitry and acquired data circuitry to condition a data signal from said first contact and said second contact, wherein said acquired data conditioning circuitry includes an amplifier.

42. (Previously Presented) The system of claim 41 further comprising:

a keypad connected with said data input interface circuitry;  
a visual display connected to said data output interface circuitry; and  
said removable memory connected to said data output interface circuitry

43. (Currently Amended) The system of claim 40 wherein said central processing unit comprises a memory that stores an output module that controls the menu of an LCD display.

44. (Previously Presented) The system of claim 40 further comprising an autonomous power supply.

45. (Currently Amended) The system of claim 40 wherein said central processing unit comprises a memory that stores an output module that directs said voltage data to be stored onto said removable memory.

46. (Previously Presented) The system of claim 45 wherein said removable memory is a compact flash removable memory.

47. (Previously Presented) The system of claim 45 wherein said voltage data on said removable memory is received by said central processing unit.

48. (Previously Presented) The system of claim 47 wherein said central processing unit is located within a device that is separate from said data acquisition circuitry.

49. (Previously Presented) The system of claim 48 wherein said central processing unit processes said voltage data and calculates said current flow through the living body between said first contact and said second contact from said voltage data and said known body impedance data.

50. (Previously Presented) The system of claim 40 wherein said known body impedance data includes a set of estimated body impedance data.

51. (Previously Presented) The system of claim 40 wherein said known body impedance data includes a set of calculated body impedance data.